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PREDICTION OF RELIABILITY IN BIOGRAPHICAL QUESTIONNAIRES.

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THE OBJECTIVES OF THIS STUDY WERE (1) TO DEVELOP A GENERAL CLASSIFICATION SYSTEN FOR LIFE HISTORY ITEMS, (2) TO DETERMINE TEST-RETEST RELIABILITY ESTIMATES, AND (3) TO ESTIMATE RESISTANCE TO EXAMINEE FAKING, FOR REPRESENTATIVE BIOGRAPHICAL QUESTIONNAIRES. TWO 100-ITEM QUESTIONNAIRES WERE CONSTRUCTED THROUGH RANDOM ASSIGNMENT BY CONTENT AREA OF 200 SELECTED ITEMS TAKEN FROM SEVERAL BIOGRAPHICAL QUESTIONNAIRES. THESE ITEMS WERE THEN RANDOMLY REARRANGED INTO NEW PRESENTATION ORDERS TO FORM TWO ADDITIONAL QUESTIONNAIRES FOR RETEST PURPOSES. EACH STEM-ALTERNATIVE COMBINATION OF THE 200 TOTAL ITEMS (MULTIPLE-CHOICE) WAS RATED ON A 9-INTERVAL SOCIAL DESIRABILITY SCALE. USING RATING VARIATION COEFFICIENTS WITH REGARD TO SOCIAL DESIRABILITY, THE INVESTIGATOR ATTEMPTED TO ESTABLISH A SINGLE ITEM CLASSIFICATION SYSTEM WITH THE GREATEST CRITERION PREDICTION. TEST AND RETEST ADMINISTRATIONS WERE SEPARATED BY A TIME PERIOD OF 10 TO 14 WEEKS. SUBJECTS WERE UNDERGRADUATE MALES IN EDUCATION, PSYCHOLOGY, AND SOCIOLOGY. BOTH NORMAL AND ARTIFICIAL INSTRUCTIONS WERE USED WHEN THE TESTS WERE ADMINISTERED, IN ORDER TO ELICIT STUDENT RESPONSES WHICH COULD BE USED TO OBTAIN ACCURATE RELIABILITY COEFFICIENTS AND "FAKEABILITY" SCORES. RESULTS SHOWED TEST-RETEST RELIABILITY COEFFICIENTS NOT TO BE HIGH, BUT MUCH LARGER THAN CORRESPONDING COEFFICIENTS OBTAINED BETWEEN NORMAL AND ARTIFICIAL (FAKE) SET CONDITIONS. (JH)

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# PREDICTION OF RELIABILITY IN BIOGRAPHICAL QUESTIONNAIRES

Cooperative Research Project No. S - 200

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## RESEARCH PROBLEM

Despite the current widespread use of life history items as predictors of academic and vocational criteria, very little is known concerning the reliability of biographical questionnaires or the extent to which they are subject to faking by candidates with strong desires to create favorable impressions. The typical biographical questionnaire contains a rather heterogeneous set of items which range from the seemingly innocuous, factual types--e.g. "What is your height"--to those more commonly found in personality inventories--e.g. "How often do you feel self - conscious?" It would appear reasonable to expect the reliability and fakeability of such items to be related to their relative position on relevant psychological scales. If an appropriate general dimension could be defined on which any life history item might be scaled, there exists the possibility of using such scale values to identify those items which will be least reliable and resistant to faking. It is essential that information of this type be available during the questionnaire-development phase of research projects so that these items can be modified or eliminated from further consideration.

## OBJECTIVES

The primary objective of this study may be briefly stated as follows:

1. Development of a general classification system for life history items which may be used in identifying those items which tend to reduce the reliability and/or resistance to fakeability of a biographical questionnaire.

Secondary objectives included:

2. Determination of test-retest reliability estimates for representative biographical questionnaires.

3. Estimation of the extent to which representative biographical questionnaires are resistant to examinee faking.

## RELATED RESEARCH

There have been no published accounts of research directly related to the problem posed above, but the quantity and scope of investigations with some degree of bearing on the study were sufficient to serve as valuable supportive material.

Biographical Prediction. A bibliography of 138 studies utilizing biographical data has been prepared by William Owens and his students at Purdue University. The list provides some indication of the popularity of

this prediction technique, particularly when one realizes that only a fraction of the research in which life history items have been employed is probably represented.

In the academic setting, biographical questionnaires have been used to predict college entrance and success, high school achievement and tenure, underachievement and overachievement, curricular interests and choice, etc. One example of such studies is the investigation by Malloy (1955), who found an average correlation of .45 between first semester college grades and responses on a 201 - item questionnaire.

The more common industrial applications of biographical questionnaires include occupational placement and prediction of job tenure and success. Validity has been demonstrated with a wide range of occupational groups, from the unskilled through top executive levels. The work of Smith et al (1961) illustrates the validity and generality of these instruments. A 484-item questionnaire was administered to 418 research and development scientists at a large oil company. Although this sample was highly restricted, the investigators reported correlations of .52 or greater with job performance ratings, creativity ratings, and patent disclosure criteria.

Life History Data Stability. The study by Keating, Patterson, and Stone (1950) is often cited as evidence for the high reliability and low fakeability of life history items. However, these authors were only concerned with factual-type items, the responses to which could be independently verified. Apparently the only study in which an effort was made to develop an overall stability index for a broad range of life history items was conducted jointly by this writer and Chaney, and is reported by Chaney (1964). In this investigation, 53 items, previously found to predict occupational interest scores on the Strong Vocational Interest Blank among a large group of college Freshmen in engineering and agriculture, were readministered 18 months later to 49 of these same students who voluntarily participated in the follow-up phase. The correlation of .86 which was obtained between scores on the two administrations may have been biased because of the motivation level of this select group.

The problem of malingering on personality inventories has been repeatedly investigated. The procedure frequently followed in such studies is to administer the instrument twice to the same group of subjects; the first time with special instructions directing the subjects to respond as they would if trying to create a good impression as an applicant for a highly desirable position or privilege, and later with the standard set of instructions (Rusmore, 1956). Response changes from one administration to the next are then used as an estimate of the amount of faking to be expected in actual practice.

Social Desirability Response Sets. During the past ten years considerable research has been undertaken on the influence of social desirability response sets in personality measurement. Of particular interest is the observed association between the rated social desirability of an item and the probability of a socially desirable response (Edwards, 1957).

The relationship is V-shaped; items which have been rated relatively low or high on the social desirability continuum are more likely to elicit socially desirable self-description responses in a counseling setting. Edwards (1963) has also demonstrated that test-retest response consistency is significantly correlated (a) with social desirability scale values (correlation ratio = .62), those items with extreme scale values being most consistent, and (b) with dispersion of the social desirability ratings of an item (r = -.46).

## PROCEDURE

Selection of Life History Items. Several objective life history questionnaires were collected which had been developed and validated by various investigators (Chaney, 1962; Holdeman, 1962; Morrison, 1961; Owens, personal file; Starry, 1962; and Williams, 1960). Two-hundred items were selected from these questionnaires on the basis of their demonstrated validity with academic or vocational criteria, representativeness of content, and appropriateness for use with college age males.

Experimental Questionnaires. Two 100-item questionnaires ($A_1$ and $B_1$) were constructed through random assignment by content area of the 200 items (See Appendixes A and B). An additional form of each ($A_2$ and $B_2$), with items randomly rearranged into new presentation orders, was also printed to minimize possible sequence effects upon retesting.

Social Desirability Scaling. Each stem-alternative combination of the 200 items was judged on the 9-interval Social Desirability scale described by Edwards (1957). Thirty male graduate and advanced undergraduate students enrolled in a dual-level industrial psychology course at Purdue University served as judges, with each student rating all the items. The instructions used for this rating are reproduced in Appendix D. Three social desirability indices were then computed for the stem-alternative combinations:

(a) Social desirability scale value, or mean ($\bar{X}$)
(b) Standard deviation ($\sigma$) of assigned social desirability ratings
(c) Coefficient of variation (CV) of the ratings

Edwards has demonstrated that indices (a) and (b) above are related to personality item consistency. Index C (CV) was employed in the present study in an attempt to establish a single item classification system with the greatest criteria prediction.

Research Design. The basic design of this study is summarized in Table 1.

| | Experimental | | | Cross-Validation | |
|---|---|---|---|---|---|
| | Test | Retest | | Test | Retest |
| Groups | Questionnaire $A_1$ | Questionnaire $A_2$ | Groups | Questionnaire $B_1$ | Questionnaire $B_2$ |
| $F_1$ (n=84) | Artificial instructions | Normal instructions | $F_2$ (n=82) | Artificial instructions | Normal instructions |
| $R_1$ (n=75) | Normal instructions | Normal instructions | $R_2$ (n=80) | Normal instructions | Normal Instructions |

Table 1. Summary of experimental and cross-validation administrations.

Questionnaires $A_1$ and its alternate form $A_2$ were used for the test and retest administrations, respectively, with the Experimental groups. Questionnaires $B_1$ and $B_2$ were employed in similar fashion for the Cross-Validation administrations. The Test and Retest administrations were separated by a 10-14 week time period.

The subjects responding to the questionnaires were undergraduate males enrolled in education, psychology and sociology courses. They were divided according to class section into four groups for the Fakeability (groups $F_1$ and $F_2$) and Reliability (groups $R_1$ and $R_2$) portions of the study. Group administrations were utilized with sufficient time being alloted for all to finish.

Groups $F_1$ and $F_2$ received the Artificial instructions (see Appendix E) in the Test administrations, asking them to respond as they would if the questionnaire was being used as a basis for acceptance/rejection at a graduate school which they desire to attend. Groups $R_1$ and $R_2$ received Normal instructions to respond conscientiously and accurately, as did all groups in the Retest administrations. Complete and usable data were obtained on 321 individuals.

Development of Criterion Measures. One response option from each item was designated as the "discriminating" alternative. In most instances they were the alternatives with the highest reported criterion correlations. Discriminating alternatives for the few items on which actual scoring keys could not be obtained were selected according to popularity plus uniqueness or extremity of the response. Response frequencies of all these alternatives were calculated to insure that they had been checked by at least 20% of the subjects. The discriminating alternatives are identified in Appendix C.

Percentages of identical responses to the discriminating alternatives upon repeated testing were computed with the data resulting from the Experimental administrations. These percentages served as the two criterion measures of item reliability and fakeability.

## ANALYSES AND FINDINGS

Validation of Social Desirability Indices. The three social desirability indices for each discriminating alternative were plotted against the corresponding reliability and fakeability measures to determine the appropriate measure of association. While the two scatterplots with social desirability scale values ($\overline{X}$) were essentially linear and suitable for analysis by product-moment formulas, relationships among the criteria measures and social desirability standard deviations and coefficients of variation were markedly non-linear. Correlation ratios (Eta) were computed in these cases. The indices of association computed from the Experimental administration data are shown in Table 2.

| Social Desirability Index | Item Reliability(%) | Item Fakeability(%) |
|---|---|---|
| Scale Value ($\overline{X}$) | .31* (P-M) | .45* (P-M) |
| Scale Value Variability ($\sigma$) | .32 (Eta) | .35 (Eta) |
| Scale Value Coefficient of Variation (C.V.) | .44* (Eta) | .53* (Eta) |

* Significant at .05 level

Table 2. Correlations of social desirability indices with item reliability and fakeability measures (Experimental group data).

Product-moment correlations of .31 and .45 were obtained between item social desirability scale values ($\overline{X}$) and the reliability and fakeability measures, respectively. F-tests associated with the correlation ratio coefficients for the variability index were not significant, thus failing to replicate Edwards (1963) personality item findings. However, significant relationships were observed between the criteria and scale value coefficients of variation.

Development of Social Desirability Prediction Categories. The principal objective of this study was to develop a classification system based on social desirability indices which would be useful in improving the reliability or resistance to fakeability of life history items. Such a system was devised for both the scale value and coefficient of variation indices through the assignment of item scoring weights. Experimental data (groups $F_1$ and $R_1$) were again used.

Since a positive linear relationship had been demonstrated between social desirability scale values and the criteria, Questionnaire A items were ranked into successive quartiles according to their mean ratings. Weights were then assigned as in Table 3, with -1 denoting a probable low consistency and +1 a probable high consistency item.

| Social Desirability Scale Values ($\bar{X}$) | Reliability and Fakeability Item Weights |
|---|---|
| ≤5.50 | -1 |
| 5.51 - 6.17 | 0 |
| 6.18 - 6.99 | 0 |
| ≥7.00 | +1 |

Table 3. Item categories for predicting consistency with the scale value index.

The cell-square-contingency method outlined by Guilford (1956, p. 337) was employed to develop the item weights for the coefficient of variation index. Items were again ranked into successive quartiles and the frequency of high and low consistency items was obtained for each. Trends of the relationships between this index and the two criteria were somewhat dissimilar, resulting in slightly different weighting systems for predicting each criterion (Table 4).

| Social Desirability Coefficients of Variation | Item Weights | |
|---|---|---|
| | Reliability | Fakeability |
| < 15.50 | 0 | 0 |
| 15.50 - 20.50 | 0 | +1 |
| 20.51 - 27.50 | +1 | 0 |
| > 27.50 | -1 | -1 |

Table 4. Item categories for predicting consistency with the coefficient of variation index.

Cross-Validation of Social Desirability Weights. Data obtained in the cross-validation administrations were employed to determine the extent to which prediction would generalize to a different questionnaire and sample of respondents. Questionnaire B items were classified as to their probable consistency according to the system developed on Questionnaire A. The assigned item weights were then correlated with the reliability and fakeability criterion measures computed from Groups $F_2$ and $R_2$. These coefficients are presented in Table 5.

| Social Desirability Index | Item Reliability | Item Fakeability |
|---|---|---|
| Scale value ($\bar{X}$) | .11 | .29* |
| Coefficient of variation | .09 | .13 |

* Sign at .01 level

Table 5. Cross-validation coefficients for social desirability indices.

The only significant validity coefficient obtained was a low positive correlation (.29) between social desirability scale values and the item fakeability measure. A great deal of shrinkage occured on all the cross-validation correlations, in part attributable to fluctuations in the social desirability index distributions from one questionnaire to another. Since biographical questionnaires tend to differ in every conceivable aspect, it is quite possible that even more shrinkage would be observed if these same prediction weights were applied to questionnaires developed by other investigators. For the general case it would appear that social desirability item classification systems could be effectively employed only with the questionnaire on which they have been developed. The tendency for items having scale values of 5.50 and below to be relatively more subject to faking may or may not prove to be stable, depending upon the extent to which the item and respondent samples used in this study are representative of their respective populations.

Overall Reliability and Fakeability of the Biographical Questionnaires. Total scores for each subject on both the Test and Retest administrations were obtained by accumulating the 100 original discriminating item weights. Test and Retest scores were then correlated to determine measures of questionnaire reliability and fakeability. These results are summarized in Table 6.

| Questionnaire | Stability: Normal Response Set | Stability: Fake Response Set |
|---|---|---|
| A | .71 (n=75) | .43 (n=84) |
| B | .80 (n=80) | .40 (n=82) |

Table 6. Stability of questionnaire scores under normal and fake set conditions.

Although the test-retest reliability coefficients are not particularly high, they are much larger than the corresponding coefficients obtained between normal and fake set conditions. Apparently many respondents will distort their answers on biographical questionnaires if given an opportunity to do so. It should be pointed out once again that these results are only suggestive. The amount of faking that would take place in an actual application setting is probably dependent on the particular item, questionnaire, respondent, and environmental characteristics and conditions which prevail.

Effect of Item Deletion on Total Score Stability. Data were available with which to make an estimate of the degree to which questionnaire fakeability could be reduced through the use of mean social desirability ratings. As the regression was apparently linear and positive, any desired number of low rated items could have been deleted. For this estimate the 18 Questionnaire B items falling in the probable low consistency category ($\leq 5.50$) were eliminated. The reliability based on the remaining 82 items was .45. When stepped-up to a 100-item test with the Spearman-Brown formula (Guilford, 1956, p. 452) this increased to .50. Additional gains in reliability should have been realized if an even larger number of the items rated low on social desirability had been replaced with higher rated ones.

## CONCLUSIONS AND IMPLICATIONS

Reliability. The test-retest reliability coefficients of .71 and .80 obtained for the two questionnaires are somewhat lower than most investigators would desire. Additional research effort should be devoted to the problem of discovering some method by which low consistency items can be efficiently identified and eliminated.

Fakeability. The students who participated in this study did not hesitate to submit fake responses under instruction to make themselves appear as good graduate school candidates, as demonstrated by correlations of .43 and .40 between fake and normal conditions. It is entirely possible, as many investigators believe, that the similarity of biographical questionnaires to the familiar application blank would tend to elicit sets to be accurate in many employment situations, although there are no research findings to substantiate this reasoning. It would be well for employers planning to use a biographical questionnaire in their selection battery to either obtain a fakeability estimate of the particular instrument under consideration or minimize possible faking gains by developing their scoring key on the basis of a preliminary longitudinal study.

Social Desirability Indices. Edward's (1963) finding of a rather high correlation between social desirability scale value variability and personality item consistency was not replicated with life history items. While the coefficient of variation did display some relationship to the consistency measures with the Experimental data, the difficulties of determining weighting schemes for non-linear relationships plus the validity shrinkage encountered with new samples of items and respondents would seem to render this index of doubtful utility.

Of the social desirability indices included in this study, the most promising results were obtained with scale value ratings. The trends of scale value relationships with both item fakeability and reliability measures were essentially linear; however, the correlation with test-retest reliability was low and did not hold up under cross-validation. A product-moment correlation of .45 was observed with item fakeability. When scoring weights derived from Questionnaire A were applied to items in the cross-validation questionnaire (B), a significant correlation of .29 was still obtained. By deleting the 18 lowest-rated items from Questionnaire B, stability under the fake condition was increased from .40 to .45.

This would be approximately .50 for a 100-item length test. There are several reasons why the magnitude of this observed increment is probably a conservative estimate of the reliability gains which could be expected in practice. If sufficient numbers of relatively higher-rated discriminating items were available, for example, a larger percentage of the low-rated items could be replaced, with a concomitant tendency for reliability to increase. It should also be pointed out that the particular item alternatives studied in this investigation were not necessarily those most related to the induced fake set condition of college application. Many of the key response shifts were probably not measured, and this may have had adverse effects on the attempts to predict fakeability. In addition, when a selection instrument is being developed the criteria and respondent populations are typically defined. It should be possible to enhance prediction of fakeability in such situations by utilizing social desirability judges who have demonstrated satisfactory performance on the criterion and by making direct reference to this measure in the rating instructions. For instance, if the criterion variable was defined as "academic success", above average students could be chosen to serve as judges and instructed to rate the social desirability of each response as made by a candidate for admission to the school. A sizeable decrease in questionnaire fakeability might be realized if full advantage could be taken of these refinements.

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# APPENDIX A

## QUESTIONNAIRE $A_1$

QUESTIONNAIRE A

1. With how many brothers and sisters were you raised?
   A. None
   B. One
   C. Two
   D. Three
   E. Four or more

2. What was your position in order of birth? (In case one of your brothers or sisters died, select the answer which was descriptive of you most of the time up to age 18).
   A. Only child.
   B. Oldest.
   C. Next to the oldest.
   D. Youngest.
   E. Other, or twins, etc.

3. In the town or area where you grew up, what was the major source of income?
   A. Agriculture, dairy, etc.
   B. Industry or manufacturing
   C. Wholesale, retail, or tourist trade
   D. mining or minerals
   E. Diversified

4. In what section of town did your family live longest while you were growing up?
   A. Lived in one of the most exclusive sections of town
   B. Lived in a good but not the best section
   C. Lived in an average section of town
   D. Lived in one of the poorer sections of town
   E. Lived in a rural area

5. What is or what was your father's chief occupation?
   A. Unskilled labor
   B. Semi-skilled labor
   C. Skilled labor
   D. Farm owner or manager
   E. Business man, including sales and supervisory work

6. How much schooling did your father have?
   A. Through 8 grades or less.
   B. Through grades 9-12
   C. Had some schooling past high school
   D. Graduated from college

7. Which of the following would best describe your father's attitude toward research work, science and scientists?
   A. Strongly critical
   B. Mildly critical
   C. Indifferent
   D. Mildly favorable
   E. Strongly favorable

8. During your adolescence how much time did you generally spend with your father in mutual activity per week?
   A. Less than 1 hour per week.
   B. 1 to 3 hours.
   C. 4 to 7 hours.
   D. 8 to 16 hours.
   E. Over 16 hours per week.

9. How democratic or authoritarian was your father about restrictive regulations, i.e., did he discuss them with you or did he tend to hand them down in an authoritarian manner?
   A. Very democratic
   B. Rather democratic.
   C. Rather authoritarian.
   D. Very authoritarian.
   E. Inconsistent.

10. When you were between the ages of 6 and 18, did your family's level of income increase or decrease?
    A. It did not keep pace with cost-of-living increases
    B. It about kept pace with cost-of-living increases
    C. It rose a little faster than the cost-of-living
    D. It rose much faster than the cost-of-living





A - continued

11. When you were ill as a child, what action did your family generally take?
    A. Called a physician
    B. Applied home remedies
    C. "Let nature take its course"
    D. None of the above

12. How much freedom did you have while in high school concerning your evenings?
    A. No restrictions by parents
    B. About the same as my friends
    C. Could not go out during week
    D. Could not go out during the weekends
    E. Only restricted as disciplinary measure

13. How did your parents or guardian feel in regard to your going on to college?
    A. Did not want you to go
    B. Seemed indifferent
    C. Showed some interest but did not think it was really necessary
    D. Maintained there was some need for a college education
    E. Constantly impressed on you the need of a good education

14. How important did your family generally regard economic and personal success?
    A. Highly important.
    B. Very important.
    C. Somewhat important.
    D. Not very important.
    E. Not important at all.

15. To what extent did you feel close to your family, i.e., how much were you an integral part of the family group?
    A. To a great extent.
    B. To a large extent.
    C. To some extent.
    D. To a small extent.
    E. To a very small extent.

16. During most of the time until you were 18, or until you left home, did you live in a place where:
    A. You were well treated and happy
    B. You were fairly well treated and satisfied
    C. Conditions were tolerable
    D. Conditions were somewhat unsatisfactory
    E. You wanted to leave as soon as possible

17. How strict or permissive was your mother in regard to limitations placed on your behavior? (Getting dirty, personal freedom, friends, etc.)
    A. Very strict
    B. Rather strict
    C. Rather permissive
    D. Very permissive
    E. Fluctuated.

18. How often did your parents (or guardian) read to you as a child?
    A. Very frequently
    B. Frequently
    C. Occasionally
    D. Rarely, if ever
    E. I don't remember.

19. How many hours a week did you spend on a part-time job while a senior in high school?
    A. None
    B. Less than 5
    C. 5 - 10
    D. 10 - 20
    E. More than 20

20. What single factor was most influential in causing you to choose the particular field you are now entering?
    A. Economic advantages of the field
    B. Opportunity for employment
    C. Father
    D. Mother
    E. Relative other than parent





A - continued

21. About how often have you changed your mind about your future vocational plans since entering high school?
    A. Have not changed them
    B. Only once
    C. Two or three times
    D. Too many to remember
    E. Have still not decided

22. What type job do you feel you will eventually take?
    A. Sales
    B. Design
    C. Personnel
    D. Research
    E. Other

23. Regarding responsibility in your job, would you:
    A. Like to have a good deal of responsibility?
    B. Like to have some responsibility, but still have someone responsible over you?
    C. Prefer a minimum of responsibility?
    D. Rather not have any responsibility?

24. Which of these do you dislike least in a job?
    A. Confusion
    B. Inefficiency
    C. Personal bad feeling
    D. Lack of a chance to progress

25. Would your choice of an ideal job be one which:
    A. Allowed a great amount of interaction with other people
    B. Would require working with a small group
    C. Would allow you to work closely with one other person
    D. Would allow you to work by yourself

26. Generally, in your work assignments would you prefer:
    A. To work on one thing at a time
    B. To work on a couple of things at a time
    C. To have many things "on the fire" simultaneously

27. Which one of the following factors do you feel to be most important in choosing a job?
    A. Opportunity for continuous employment
    B. Opportunity to work with pleasant people
    C. Opportunity for advancement
    D. Opportunity for prestige
    E. Opportunity to do a variety of work

28. What percent of your college expenses will you earn?
    A. Less than 10%
    B. More than 10% but less than 25%
    C. More than 25% but less than 50%
    D. More than 50% but less than 75%
    E. More than 75%

29. Would you seek employment in a job in which you did not meet the stated qualifications, but nevertheless felt personally qualified?
    A. Certainly
    B. Probably
    C. It's unlikely
    D. I would need more information

30. In order to attain minimal satisfaction in a job, how well liked by your associates and supervisors must you be?
    A. Considerably above average
    B. Somewhat above average
    C. About average
    D. Slightly below average
    E. Well below average.

31. Which was the highest grade you reached in the Boy Scouts of America?
    A. Tenderfoot or Second Class Scout
    B. First Class Scout
    C. Star Scout or Life Scout
    D. Eagle Scout
    E. Did not belong to the Boy Scouts

32. How were the majority of your evenings spent during your high school days? (choose one)
    A. Studying
    B. Working on hobbies
    C. With friends
    D. Reading books and magazines

A - continued

33. What type of reading, other than school work, did you tend to do most during the last 2 years?
   A. Biographies or histories
   B. Technical Books
   C. Literary Classics
   D. Novels, mysteries, science fiction, etc.
   E. None of these

34. Which one of the following most nearly fits your pattern of reading?
   A. I devote considerable time to reading in areas directly related to my work, but little time reading other things.
   B. I devote much time to reading of all kinds including that related to my work
   C. I find that I have little time for reading although I read as much as I can
   D. About the only reading I do is the newspaper and occasionally a few magazines
   E. I always have more important things to do than read

35. To what extent do you read daily newspapers?
   A. Read one or more newspapers thoroughly each day
   B. Read part of a newspaper each day
   C. Read a newspaper two or three times a week
   D. Seldom read a newspaper
   E. Almost never read a newspaper

36. About how many motion pictures have you attended during the past year?
   A. None
   B. 1 or 2
   C. 3 - 10
   D. 11 - 20
   E. 21 or more

37. Which <u>one</u> of the following do your <u>prefer</u>? Consider that each may be presented through books, magazines, movies, stage plays, radio, TV, etc.
   A. Mystery or detective stories
   B. Current and political events
   C. Historical or biographical stories
   D. Science fiction

38. To how many clubs or social organizations did you belong in high school?
   A. 0
   B. 1
   C. 2
   D. 3
   E. 4 or more

39. How many elective offices did you hold while in high school?
   A. None
   B. 1 or 2
   C. 3 to 5
   D. 6 to 10
   E. 11 or more

40. What function would you enjoy performing most if you were associated with an athletic team?
   A. Coaching players.
   B. Devising new plays.
   C. Performing various plays.
   D. Handling business functions.
   E. Refereeing

41. During your childhood how often did you construct your own toys? (Build an orange crate car. etc.)
   A. Very frequently.
   B. Frequently
   C. Occasionally.
   D. Seldom
   E. Never

42. How many of the following hobbies had you actively pursued <u>before</u> entering high school?
   Model-building
   Photography
   Astronomy
   Radio
   Electric Motors
   Gasoline Engines
   Chemistry or physics experiments
   Stamp or old coin collecting
   Designing things
   A. None of the choices above
   B. One of the choices above
   C. Two of the choices above
   D. Three-four of the choices above
   E. Five or more of the choices above

A - continued

43. Which of the following do you like least?
   A. Outdoor sports (football, baseball, etc.)
   B. Fishing, camping, hunting
   C. reading, stamp collecting
   D. Building things, woodworking, crafts

44. Which one of the following do you look forward to most in your leisure time activities?
   A. A chance to rest and relax
   B. A chance to putter around
   C. A chance to be with other people
   D. A chance to get outdoors or be active
   E. A chance to be alone with my thoughts

45. What size high school did you attend?
   A. Fewer than 100
   B. Between 100 and 500
   C. Between 500 and 1,000
   D. Between 1,000 and 2,000
   E. More than 2,000

46. In school which type of courses did you most enjoy? (check one)
   A. Problems, math
   B. Lecture
   C. Laboratory
   D. Discussion
   E. No preference

47. At what time of day did you do most of your best studying?
   A. Morning
   B. Afternoon
   C. Evening
   D. Night
   E. No particular time

48. About how many hours a week did you study during high school? (average)
   A. 0-4
   B. 5-9
   C. 10-14
   D. 15-19
   E. 20 or more

49. Which of your high school subjects did you enjoy the most? (check one)
   A. Physical science, chemistry, physics, mathematics
   B. Natural science, biology, zoology
   C. History, economics, civics
   D. Commercial courses, bookkeeping
   E. Shop courses

50. Concerning the material which was presented to you in high school and college did you find you:
   A. Often felt the need for a more thorough explanation
   B. Sometimes felt the need for more explanation than was presented
   C. Usually felt that the material presented was adequately explained

51. What did you usually do during your high school days when you found problems hard to understand?
   A. Asked teachers or parents for help
   B. Asked schoolmates for help
   C. Did some background reading
   D. Kept at it until the problem was solved
   E. None of these

52. Which of your high school courses were easiest?
   A. Physical science, chemistry, physics, mathematics
   B. Natural science, biology, zoology
   C. History, economics, civics
   D. Commercial courses, bookkeeping typing
   E. Shop courses

53. What grades did you make in mathematics in high school (on an average)
   A. A's
   B. B's
   C. C's
   D. D's
   E. Do not know

54. As you grew up, how did you feel about high school?
   A. Liked it very much
   B. Liked it most of the time
   C. Just accepted it as necessary
   D. Was often a little unhappy with it
   E. Totally disliked it and was glad to finish

55. During your pre-college training how would your teachers generally have evaluated you on a "desirable students" scale? Consider such things as whether you were cooperative, punctual, reserved, etc., or uncooperative, noisy, tardy, a trouble-maker, a smart aleck, etc.

   A. Desirable student
   B. Rather desirable
   C. Not particularly desirable
   D. Rather undesirable
   E. Undesirable

56. What was your high school grade average (approximately)?
   A. A (4.00 - 3.50)
   B. High B (3.49 -3.00
   C. Low B (2.49 - 2.00)
   D. High C (2.49 - 2.00)
   E. Less than 2.00

57. On what basis did you select a college for your undergraduate work?
   A. Location
   B. Overall reputation of college
   C. The reputation of the college in your specialty
   D. Scholarship granted to you
   E. Other reasons than above

58. When you were in school (grade or high school), where did you and your friends most often get together?
   A. At a friend's home
   B. At a club, dance hall, or public building
   C. At your house
   D. On the street corner
   E. At church activities

59. How often do you date, on the average?
   A. Am married, or do not date
   B. Only once in awhile (less than once a month)
   C. One to three dates per month
   D. Once a week
   E. Two or more per week

60. Other things being equal, what sort of a mate would you most prefer?
   A. One who would command social admiration and respect from others
   B. One whose primary interest is her husband and her family
   C. One who is capable of giving interesting intellectual companionship
   D. Other than the above

61. How do you usually behave in a group session with your associates?
   A. I feel free to express my views, and I sway the group considerably
   B. I feel free to express my views, but the group doesn't always share them
   C. I am reluctant to express my views, but they are usually very well received
   D. I am reluctant to express my views and unsure of their reception
   E. I don't usually participate

62. Which of the following best describes your feelings of friendship towards most people?
   A. I have very few close friends. Generally I do not meet people well or make friends easily
   B. I have a few close friends. Generally I meet people and make friends fairly easily although probably not as easily as most people.
   C. I probably have a little less than average number of close friends, since generally I do not have the time or the interest to spend with them
   D. I have about the average number of close friends, and I meet people and make friends about as well as most people.
   E. I have many close friends, and I try to take an interest in most people and make friends easier than most people

A - continued

63. How often are you inclined to analyze the motives of others?
   A. Frequently
   B. Occasionally
   C. Rarely
   D. Very rarely

64. To what extent do you tend to express any dislikes you may have for a person?
   A. I usually express them
   B. I occasionally express them
   C. I rarely express them
   D. I very rarely express them
   E. It depends on the person

65. To what extent are you the kind of individual who becomes so absorbed in his own work and interests that he does not mind a lack of friends?
   A. To a great extent
   B. To some extent
   C. To a small extent
   D. To a very small extent
   E. Not at all

66. How achievement oriented were your friends during your youth?
   A. Very achievement oriented
   B. Quite achievement oriented
   C. Somewhat achievement oriented
   D. Not very achievement oriented

67. How do you react to the views of others?
   A. Enjoy an exchange of views and a free-swinging discussion
   B. Am interested in them, and somewhat influenced by them
   C. Am interested in them, but not much influenced by them
   D. Am neither interested in them nor influenced by them
   E. Try to avoid being exposed to "bull-session" speculation

68. When your opinions differ from others do you generally:
   A. Keep them to yourself
   B. Express them only to associates
   C. Express them regardless of status of person differing with you

69. How often do you tell other people your troubles?
   A. Never
   B. Not very often
   C. Occasionally, to a few people I can trust
   D. I almost always discuss them with others

70. What is your weight?
   A. Under 135 pounds
   B. 136 to 150 pounds
   C. 151 to 170 pounds
   D. 171 to 185 pounds
   E. Over 185 pounds

71. Between the ages of twelve and twenty-one, how often were you sufficiently ill to require hospitalization?
   A. 0
   B. 1
   C. 2
   D. 3
   E. 4 or more times

72 How would you evaluate your health?
   A. Very good - much better than other people's
   B. Quite good - somewhat above average
   C. About average
   D. Somewhat poorer than average
   E. Very poor health - source of considerable concern

73. What have you done to try to keep healthy in the past year?
   A. Visited the doctor regularly
   B. Got plenty of sleep and fresh air
   C. Didn't overeat
   D. Stopped worrying
   E. Didn't do anything in particular

74. How much musical ability do you possess?
   A. None
   B. Very little
   C. Some
   D. Quite a bit

A - continued

75. When you encounter in your work something you cannot solve do you:
   A. Find yourself unable to get it off your mind
   B. Push it out of your mind by engaging in some other activity
   C. Speak to people about it in hope of getting some new insight
   D. Something else

76. When you were a high school student were you
   A. One of the most active and popular students
   B. More active and popular than most students
   C. About as active and popular as most students
   D. Not quite as active and popular as most students
   E. Not very active and didn't have very many friends

77. How do you tend to react to an unpleasant situation?
   A. I generally try to react immediately and figure out the best solution
   B. Most of time I put off a decision for a little while so I can think it over.
   C. Often I want to sleep on it or put off a decision for quite awhile
   D. I don't worry about it. things will take care of themselves

78. How creative do you feel you are?
   A. Highly creative
   B. Somewhat more creative than most in your field
   C. Moderately creative
   D. Somewhat less creative than most in your field
   E. Not creative

79. How fast do you usually work?
   A. Much faster than most people
   B. Somewhat faster than most people
   C. Somewhat slower than most people
   D. Much slower than most people
   E. Unable to tell

80. Interruptions by others when you are in the midst of a problem:
   A. Annoy you--hard to get back to what you were doing
   B. Bother you only a little--but you prefer not to be interrupted
   C. Don't bother you--in fact, you find it almost a challenge to show your ability to keep several things going at the same time.

81. Which one of the following best describes what you do in making important decisions?
   A. Take time to check with parents
   B. Make the decision, then notify parents
   C. Do not notify parents
   D. Seek advice of other friends
   E. Work the decision out independently

82. Which of the following is most important to you?
   A. Professional status or authority
   B. Money
   C. Family and friends
   D. Religion
   E. Recreation

83. Looking back on your life, up through adolescence, which of the following best describes you?
   A. Lonely and troubled
   B. Happy and carefree
   C. Filled with curiousity
   D. Tough and indifferent
   E. Given to emotional extremes of joy and sorrow

84. In comparison with your friends, what do you think of your personal appearance?
   A. Almost all of my friends are better looking
   B. Most of them are better looking
   C. I am equal to most of them in appearance
   D. I am better than most of them in appearance
   E. I don't feel strongly one way or the other about my appearance





A - continued

85. Concerning your present and future activities, do you--
   A. Make rather precise and detailed plans
   B. Make broad and general plans, but not detailed ones
   C Make few plans, let "nature take its course"

86. Of the following, which do you do best?
   A. Face-to-face interviews
   B. Written reports
   C. Group discussions or conferences
   D. Lectures or speeches to groups
   E. Telephone conversations

87. People can be divided into two distinct classes: the weak and the strong. (Check one)
   A. Strongly agree
   B. Agree
   C. I can't make up my mind
   D. Disagree
   E. Strongly disagree

88. Which of the following tended to be the most distressing to you in your youth?
   A. Unpopularity with boys
   B. Shyness with girls
   C. Unpopularity with teachers
   D. Lack of achievement in school
   E. None of the above were at all distressing to me

89. How would you describe your curiosity when you were of high school age?
   A. Very curious about many things
   B. More curious than average about intellectual topics
   C. More curious than average about mechanical things
   D. About average in curiosity
   E. Probably less curious than average

90. From which one of the following do you think you had gained the most knowledge up to the time you were about 18?
   A. School
   B. Home environment
   C. Extra-curricular reading
   D. My own observations

91. To what extent did you participate in adolescent "fads" or activities, i.e., belong to certain clubs, wear certain types of shoes, sweaters, etc.?
   A. To a great extent
   B. To some extent
   C. To a small extent
   D. Not at all
   E. No "fads" in which to participate

92. During your youth to what extent did you prefer your life to be well organized, i.e., prefering a known routine to conflicting activities?
   A. To a great extent
   B. To some extent
   C. To a small extent
   D. To a very small extent

93. To what extent do you tend to forget trivial things such as names of highways, small towns, details, obscure facts, etc.?
   A. To a great extent
   B. To some extent
   C. To a small extent
   D. To a very small extent

94. Which one of the following factors do you feel to be most responsible for the world's ills?
   A. The lack of concern for one's fellowman, and an absence of ideals.
   B. The great emphasis on money as an indicator of success
   C. The necessity of conforming to the norms of our present society--lack of individualism
   D. The lack of privacy necessary for self-development





A - continued

95. What is your social philosophy?
   A. Our civilization advances on the backs of a few able people who must be given the breaks
   B. The problems of mental deficiency and severe maladjustment should be our first concern
   C. Since the U.S. is a democracy, our concern must be for the average man

96. As a boy, or young man, do you think you were least often regarded as:
   A. Unduly sensitive
   B. Over-confident ("cocky")
   C. Radical or unconventional
   D. Physically (but not mentally) lazy
   E. Introverted

97. How far do you intend to send your sons in school? (check one)
   A. High School
   B. College
   C. Graduate or professional schools

98. Approximately what annual salary do you think you will be earning ten years from now?
   A. $10,000
   B. $12,500
   C. $15,000
   D. $17,500
   E. $20,000 or more

99. What is the minimum contribution to the theoretical development of your specialty in science with which you would be satisfied during your professional career?
   A. No theoretical contributions. All experimental or administrative.
   B. Small theoretical contributions
   C. Moderate theoretical contributions
   D. Large theoretical contributions
   E. Very substantial theoretical contributions.

100. What is the minimum quantity of publications, research reports, etc., with which you would be satisfied during your professional career?
   A. I expect to publish rarely
   B. I expect to publish at least occasionally
   C. I expect to publish a moderate amount
   D. I expect to publish rather extensively
   E. I expect to publish a great deal

# APPENDIX B

## QUESTIONNAIRE $B_1$

QUESTIONNAIRE - B

1. About how large was the town in which you grew up? (Spent most of your time up to age 18?)
   A. No town, rural area
   B. Under 1,000
   C. 1,000 to 5,000
   D. 5,000 to 25,000
   E. Over 25,000

2. With how many brothers were you raised?
   A. None
   B. One
   C. Two
   D. Three
   E. Four or more

3. When you were growing up, were you:
   A. An only child
   B. Particularly "close" to a brother
   C. Particularly "close" to a sister
   D. A bit isolated from other children in the family by sex, age, or something else
   E. None of the above

4. How much independence did your family allow you in high school?
   A. Little independence; they were very restrictive
   B. About as much as the rest of my friends
   C. They were quite lenient
   D. As much independence as I wanted

5. In the past ten years, has your father been employed:
   A. At one job
   B. At two jobs
   C. At three or more jobs
   D. He is retired (10 years or longer)
   E. He has been dead for 10 years or longer

6. Which <u>one</u> of the following was most characteristic of your father while you were growing up?
   A. A strict person with strong moral convictions
   B. A strict person, but not highly moralistic
   C. A person of average morals and strictness
   D. A person who was forced to modify his convictions
   E. A person not concerned about moral issues

7. During your youth to what extent did your father place emphasis on your achievements?
   A. To a large extent
   B. To some extent
   C. To a small extent
   D. Does not apply

8. How strict or permissive was your father in regard to limitations placed on your behavior? (Getting dirty, personal freedom, friends, etc.)
   A. Strict
   B. Rather strict
   C. Rather permissive
   D. Permissive
   E. Fluctuated

9. Was your mother employed and away from home at least part time and at least 20 hrs. a week while you were growing up?
   A. No
   B. Yes, she started before I was six years old
   C. Yes, she started between my ages of 6 and 11
   D. Yes, she started between my ages of 12 and 18
   E. Yes, but she started after I was 18 years old

10. As a child, whom did you confide in the most?
   A. Your father
   B. Your mother
   C. A brother
   D. A sister
   E. Some other person or no one

11. During your youth to what extent did your parents openly encourage you to take an interest in discovering things for yourself, as in science-like activities, etc.?
   A. To a large extent
   B. To some extent
   C. To a small extent
   D. Not at all
   E. They permitted it without encouragement

B - continued

12. Where did most of your spending money come from during your years in high school?
    A. Allowance from family
    B. My own earnings
    C. Partly allowance, partly earnings
    D. Other sources
    E. Had no spending money

13. Where social activities were concerned, my parents were
    A. Very active in social matters
    B. Usually engaged in some social functions
    C. Normally not very active
    D. Very seldom concerned with social matters

14. How much money did your family have while you were going to high school?
    A. About as much as my classmates
    B. More than most of my classmates
    C. Less than most of my classmates
    D. A great deal more than most people I know
    E. Do not know, or had not considered it

15. How would you describe your life at home during adolescense?
    A. Extremely happy
    B. More happy than most
    C. About average
    D. A little less happy than average
    E. Extremely unhappy

16. How did you get along with your brothers and sisters when you were growing up?
    A. I was an only child
    B. We got along very well
    C. We quarreled more than average
    D. We rarely agreed
    E. We didn't quarrel, but we didn't have much to do with one another

17. How often were the books in your home used by the members of your family?
    A. Very frequently
    B. Frequently
    C. Occasionally
    D. Rarely
    E. Very rarely

18. How old were you when you first earned a little money of your own?
    A. Under 10 years
    B. 10 to 12 years old
    C. 12 to 14 years old
    D. 14 to 16 years old
    E. Over 16 years old

19. What sort of occupation would your parents most like you to enter?
    A. Have no preference
    B. Same as father
    C. Agriculture, dairy, etc.
    D. Profession (doctor, lawyer, engineer, etc.)
    E. Other

20. Which of these do you <u>dislike</u> <u>most</u> in a Job?
    A. Confusion
    B. Inefficiency
    C. Personal bad feeling
    D. Lack of a chance to progress

21. What sort of work do you like best?
    A. Indoor work
    B. Outdoor work
    C. Work with people
    D. Work with things
    E. Work with ideas

22. If I could work on what I would consider an ideal job, I would:
    A. Work entirely autonomously
    B. Work under only suggested priorities
    C. Expect to be told what to do, but <u>not</u> how to do it
    D. Expect to be told what to do and receive suggestions as to how to do it
    E. Expect to be told what to do and how to do it

B - continued

23. The type of work that interests you most is work that
    A. Has much fine detail involved
    B. Has some fine detail aspects
    C. Very seldom requires fine detail work
    D. Would never require you to bother with fine details

24. Which one of the following factors do you feel to be most important in choosing a job?
    A. Opportunity to use your own ideas
    B. Opportunity to do good for others
    C. Opportunity for travel
    D. Opportunity for good working hours
    E. Opportunity to earn money

25. What single factor was most influential in causing you to choose the particular field you are now entering?
    A. Social advantages of the occupation
    B. College catalogs and announcements
    C. Hobby
    D. Guidance worker in high school
    E. Desire to accomplish a specific goal in field

26. When did you decide upon your occupation?
    A. In junior high school or earlier
    B. In high school
    C. First 2 years in college
    D. An still undecided

27. When are you generally willing to say that a job is done?
    A. When I feel that it's perfect down to the last detail
    B. When I feel that no one else will find fault with it
    C. When I think that it will satisfy everyone concerned
    D. When I'm sure that the main thing to be done has been done
    E. When I'm satisfied, or when more pressing matters emerge

28. How good do you think you are, or could be, as a supervisor?
    A. In the top 5%
    B. In the Upper 20% (but not the top 5%)
    C. In the upper half (but not top 25%)
    D. In the lower half
    E. Don't know

29. What would be the least important factor in your recommending an employee for an increase or promotion?
    A. Ability to get the work out
    B. Quality of work or technical competence
    C. Ability to get along with people
    D. Ability to sell ideas and express himself
    E. Something else

30. What type of book do you prefer to read for pleasure?
    A. Novels
    B. Technical books
    C. Mystery stories
    D. Biography and history
    E. Humor

31. How many non-fiction books have you read in the past year, not counting required reading or text books?
    A. None
    B. 1
    C. 2 - 4
    D. 5 - 8
    E. 9 or more

32. Compared to others, how much reading did you do between the ages of 12 and 18 (excluding school work)?
    A. Read everything that looked interesting
    B. Read during a large part of my free time
    C. Read occasionally
    D. Read seldom, from lack of opportunity
    E. Read seldom, from choice

33. How many magazines and periodicals do you read consistently?
    A. 0
    B. 1
    C. 2 or 3
    D. 4 to 6
    E. 7 or more

34. When you go to a movie, what kind of picture do you usually prefer? (of the types listed below)
    A. Comedy
    B. Western
    C. Adventure
    D. Dramatic
    E. Musical

B - continued

35. Which one of the following types of radio or TV programs do you like best?
    A. News, or sports events
    B. Operas, symphonies, or concerts
    C. Comedy or variety programs
    D. Plays or dramatic series
    E. Practically never listen to the radio or TV

36. How often did you invent something to serve a needed purpose during childhood or adolescence?
    A. Never, to the best of my recollection
    B. One or two times
    C. Three to five times
    D. Six or more times

37. Please indicate the extent to which you have participated in playing bridge or other card games.
    A. Very frequently
    B. Frequently
    C. Occasionally
    D. Seldom

38. To you, travel has always seemed to be
    A. A very exciting and worthwhile experience
    B. An enjoyable relief from my normal routine
    C. Something which I can take or leave alone
    D. Something which is to be done only when absolutely necessary

39. Which one of the following activities gave you the greatest pleasure while in high school?
    A. Participation in or attending high school sports events
    B. Social interaction with other students (dancing, dating, etc.)
    C. Participation in organized school activities including plays, band, and student government
    D. Achieving academic success and recognition
    E. None of the above

40. During your last two years in high school about how many hours a week, both in and out of school, did you spend on athletics?
    A. None
    B. 1 - 4
    C. 5 - 9
    D. 10 - 14
    E. 15 or more

41. During your grammar and/or high school days, in which type of activity did you participate the most? (check one)
    A. Sand-lot games
    B. Boy Scouts, 4-H clubs, F.F.A. or YMCA
    C. Student government, school politics
    D. Student paper, science clubs
    E. I worked or studied most of the time and did not participate

42. In how many of the following organized activities did you participate during high school?
    Musical Organizations
    Church Activities
    Debating Societies
    Literary Clubs
    Model Clubs
    Athletic Teams
    Art Societies
    Dancing Groups
    Science Clubs
    Dramatic Groups
    Student Government
    Journalism Clubs
    A. None
    B. One
    C. Two
    D. Three
    E. Four or more

43. In the organizations you belong to, which describes you best?
    A. Am not very active
    B. Am a reliable member, but do not wish to hold a position of importance
    C. Would like to hold an office, but have not been appointed to one
    D. Have held at least one important office.
    E. Have held several important offices.

B - continued

44. How many leadership offices do you hold now or have you held in high school activities? (president, chairman, etc.)
   A. more than 4
   B. 3
   C. 2
   D. 1
   E. None

45. What were your main subjects in high school? (check one)
   A. Business or commercial
   B. Trade or industrial
   C. Agricultural
   D. Fine arts or music
   E. Academic or college preparatory

46. Which of your high school courses were most difficult?
   A. Physical science, chemistry, physics, mathematics
   B. Natural science, biology, zoology
   C. History, economics, civics
   D. Commercial courses, bookkeeping, typing
   E. Shop courses

47. How would you classify yourself as a student in high school?
   A. Considerably above average
   B. Somewhat above average
   C. Average
   D. Below average
   E. Poor

48. Which of your high school courses did you enjoy least?
   A. Physical science, chemistry, physics, mathematics
   B. Natural science, biology, zoology
   C. History, economics, civics
   D. Commercial courses, bookkeeping, typing
   E. Shop courses

49. What grades did you make in science courses in high school (on an average)
   A. A's
   B. B's
   C. C's
   D. D's
   E. Do not know

50. At what age did you first develop a high interest in math?
   A. Under 10 years of age.
   B. 10 to 15
   C. 16 to 20
   D. 21 or over
   E. Never

51. In general, how good a teaching job do you feel your high school science teachers did?
   A. An extremely good job
   B. A fairly good job
   C. Neither good nor poor
   D. A rather poor job
   E. An extremely poor job

52. To what extent did the high school teacher who was most influential in your development take an interest in you?
   A. A strong interest
   B. A moderate interest
   C. About average interest
   D. Little interest
   E. No interest al all

53. As a student did you
   A. Do your best work in mathematics and science courses
   B. Annoy your teachers with constant questioning
   C. Resent "busy work" or routine courses
   D. Often find yourself interested in finding simpler ways of solving problems
   E. Sometimes fail to complete an assignment because you deliberated too long or "daydreamed" a bit

54. How much better could you have done in high school, scholastically, than you actually did?
   A. Quite a bit better--I didn't apply myself
   B. A little better--I was not too serious
   C. Not much better--I did about as well as my abilities permitted

B - continued

55. What was your percentile ranking in your graduating class?
    A. Upper 10%
    B. Upper quarter (but not top 10%)
    C. Second quarter
    D. Lower half
    E. Do not know

56. When did you first consider entering college?
    A. Have always planned to come to college
    B. Began to consider it in junior high school
    C. Senior high school
    D. While in the service
    E. After graduation, but not in service

57. Who was <u>most</u> influential in your decision to go to college?
    A. Yourself
    B. Parents
    C. Another adult, teacher, minister
    D. Friends
    E. No special person

58. At what age did you start dating girls as a fairly regular part of your social life?
    A. Before 14
    B. 14 or 15
    C. 16 or 17
    D. 18 or over
    E. Have not started dating girls regularly

59. To what extent did you "play the field" rather than going out with only one girl at a time?
    A. "Played the field" to a great extent
    B. To some extent
    C. To a small extent
    D. Not at all--only one girl at a time
    E. Dated too rarely to say

60. Do you and your acquaintances generally agree on politics?
    A. Yes, all of them feel as I do about politics
    B. Most of them vote as I do, as far as I know
    C. Some of them vote as I do, as far as I know
    D. Most of them vote differently than I do
    E. Have no idea how they feel about politics, or rarely discuss politics; not interested in politics, etc.

61. In general, how much education did your high school friends think was necessary for future success and security?
    A. Some high school
    B. A high school degree
    C. A college degree
    D. A graduate degree
    E. Don't know

62. During your youth when teams were being chosen for games, you were usually picked
    A. Near the first
    B. Around the middle
    C. Near the end
    D. I was usually one of those doing the choosing
    E. I very seldom had time to play games

63. During your adolescent period, how often did you manage to "get your own way" with your associates and friends? (In other words, go to the show <u>you</u> wanted to see, etc.)
    A. All the time
    B. Quite frequently
    C. Occasionally
    D. Seldom or never
    E. Too few activities to say

B - continued

64. To what extent do ;ou enjoy conversation with rather ordinary conventional people?
   A. It is usually interesting
   B. It is occasionally interesting
   C. It is rarely interesting
   D. It tends to annoy me because of its superficiality
   E. It depends on the conversation

65. To what extent have you found books more interesting than people?
   A. Frequently
   B. Occasionally
   C. Rarely
   D. Very rarely, if ever

66. How many <u>very close</u> friends do you have today?
   A. None that fit that description
   B. 1 or 2
   C. 3 - 4
   D. 5 - 7
   E. 8 or more

67. How often do young people, outside of your immediate family, come to you for advice?
   A. Never
   B. Rarely
   C. Occasionally
   D. Quite often
   E. Constantly

68. Which one of these characteristics bothers you <u>most</u> in people you meet?
   A. Braging
   B. Shyness
   C. Lack of initiative
   D. Trying to get something for nothing
   E. Being very competitive

69. How often do people tell <u>you</u> their personal troubles?
   A. Never
   B. Rarely
   C. Occasionally
   D. Quite often
   E. Constantly

70. What is your height?
   A. 5' to 5' 4"
   B. 5' 5" to 5' 7"
   C. 5' 8" to 5' 10"
   D. 5' 11" to 6' 1"
   E. 6' 2" or over

71. In the past few months, how often have you had to turn down, or break, a social engagement because you were tired?
   A. Much more often than I wanted to
   B. Occasionally, but not too frequently
   C. Rarely; I usually snap back after a hard day
   D. I have an extremely high energy level; almost never get tired

72. Between the ages of 12 and 18, approximately how often did you suffer minor illnesses?
   A. Much more often than the average person
   B. More often than the average person
   C. Less often than the average person
   D. Seldom
   E. Never

73. In what size city would you prefer to live?
   A. Rural or country
   B. 5,000 or less
   C. 5,000 to 50,000
   D. 50,000 to 200,000
   E. 200,000 or more

74. Where would you belong in a list of 100 typical people in the kind of job you can do best?
   A. In the best 5%
   B. In the upper third (but not in the best 5%)
   C. In the middle third
   D. In the lowest third
   E. Haven't given it much thought

B - continued

75. How have you reacted to the advantages and opportunities that have been presented to you?
   A. You have taken advantage of every opportunity
   B. You have generally tried to take advantage of any opportunity
   C. You have taken advantage of some and not of others
   D. You have not had too many opportunities, but have taken advantage of the ones you have had
   E. You have failed to take advantage of any opportunities presented

76. How often do you feel dissatisfied with yourself?
   A. Frequently
   B. Occasionally
   C. Rarely
   D. Hardly ever

77. Which one of the following least describes you?
   A. Socially introverted--not a joiner
   B. A dreamer-would rather speculate than plunge into action
   C. Unconventional--not much influenced by precedence
   D. Physically lazy-intrigued with all labor-saving devices and techniques
   E. Dislikes routine or detailed work

78. Which one of the following do you think is closest to describing your personality?
   A. Difficult to really get to know
   B. Have some really close friends and a number of acquaintances
   C. Friendly and easy-going; have a lot of friends
   D. Very jolly; the "life-of-the-party" type
   E. Find it extremely difficult to describe myself

79. With regard to taking risks, which best describes you?
   A. Hardly ever take a risk
   B. Sometimes take a risk
   C. Generally take a risk
   D. I'm a gambler at heart

80. I strive
   A. To be like others
   B. To be like I feel others expect me to be
   C. To be like I want to be
   D. To be different from other people

81. What do you consider to be the major motivating force in your life?
   A. Prestige
   B. Material gains
   C. To come up with something new
   D. To gain a position of security
   E. Something else

82. Your own personality most closely resembles that of your
   A. Father
   B. Mother
   C. Brother
   D. Sister
   E. None of these, or don't know

83. Which of the following is least important to you?
   A. Professional status, or authority
   B. Money
   C. Family and Friends
   D. Religion
   E. Recreation

84. How do you feel about your self-confidence?
   A. I am very confident or myself in most phases of activity
   B. Am quite confident of myself in most phases of activity
   C. Have quite a bit of self-confidence about my intellectual ability, but I am not as self-confident about my social abilities
   D. Have quite a bit of self-confidence about my social ability, but I am not as self-confident about my intellectual ability
   E. Lack some self-confidence in both intellectual and social activities

B - continued

85. I consider my achievements to date to have been
    A. Less than those who have the same amount of education
    B. Equal to those who have the same amount of education
    C. More than those who have the same amount of educatiou

86. In most tasks do you
    A. Work quickly
    B. Work at about the same pace as other people
    C. Work slowly

87. How do you compare with your friends in athletic ability?
    A. Very much better than most
    B. A little better than average
    C. About average
    D. A little poorer than average
    E. My friends are very much better than I am

88. How well do you do most things you have decided to do?
    A. Almost always succeed in the things you attempt and do them better than most people could
    B. Usually get the tings done that you attempt but seldom do them as well as you want to
    C. Find that you do most things as well as other people do
    D. Often find that you have bitten off more than you can chew and have to give up

89. At what age did you first take a real interest in what makes thinga work, such as vacuum cleaners, electric lights, alarm clocks, etc.?
    A. I never did
    B. I don't remember
    C. Under 6 years of age
    D. 6 to 12
    E. Over 12 years of age

90. During your childhood, how often were you emotionally upset, or crying, in the presence of others?
    A. Occasionally
    B. Rarely
    C. Very rarely
    D. Practically never

91. During your childhood how often did you suggest the projects of your neighborhood friands? (Build a tree hut, make a lemonade stand, put on plays, etc.)
    A. Frequently
    B. Occasionally
    C. Seldom
    D. Never
    E. Too few projects to say

92. How old were you when you obtained your first car?
    A. 15 or younger
    B. 16 to 17
    C. 18 to 19
    D. 20 or over
    E. Never owned a car

93. Which of the following best describes how socially skilled you were during your adolescence?
    A. Definitely below average
    B. Slightly below average
    C. About average
    D. Slightly above average
    E. Definitely above average

94. How would you describe your ambition when you were an adolescent?
    A. I was very ambitious, I intended to make something of myself
    B. I was quite ambitious, I took it for granted I would make something of myself
    C. About average in ambition
    D. Not very ambitious, I wasn't concerned about it

B - continued

95. Which of the following best describes how you most often think deeply about a problem?
   A. Visual: Thinking in terms of pictures, objects, diagrams, etc.
   B. Verbal: Thinking in terms of words without visualizing them; e.g., talking without making any sound while thinking
   C. Imageless: Thinking not accompanied by either of the above
   D. Uncertain

96. How would you describe your general emotional state?
   A. Very happy, high spirits
   B. Up and down in spirits
   C. Steady, neither up nor down
   D. Somewhat moody and low in spirits
   E. Somewhat unhappy and low in spirits.

97. How often do you wonder about what life in general is about?
   A. I never think about these things, it is sufficiently clear to me what life is all about
   B. I very rarely think about these things. Mature people are more concerned with doing their jobs well.
   C. Now and then I wonder about "life", but usually dismiss it rather readily because it is an unproductive area of thought
   D. Sometimes I ponder about these things, but I am not deeply concerned
   E. Sometimes I wonder what life is all about--where we are headed --what can it all mean--what is man doing here

98. Which <u>one</u> of the following goals would you <u>most</u> like to reach during the next five years?
   A. Become an executive
   B. Attain economic security
   C. Gain the respect of your associates
   D. Develop new techniques and inventions
   E. Be in a position where you can be free to work on ideas that interest you

99. Concerning my future plans
   A. I'm quite positive on what work I'd like to be doing 10 years from now
   B. I think I know what work I'd like to be doing 10 years from now
   C. I am not sure what work I'd like to be doing 10 years from now
   D. I don't care what work I'll be doing 10 years from now (if it is worthwhile)
   E. I haven't given the future that much thought

100. What level of original work do you want to produce at least once in your field in order to satisfy your minimum professional goals?
   A. Little or no original work
   B. Noticeable level of original work
   C. Moderately high level of original work
   D. High level of original work
   E. Very high level of original work

# APPENDIX C

## LIST OF DISCRIMINATING

## ALTERNATIVES

## QUESTIONNAIRE $A_1$

| Item | Alternative | Item | Alternative | Item | Alternative | Item | Alternative |
|---|---|---|---|---|---|---|---|
| 1. | C | 26. | A | 51. | B | 76. | B |
| 2. | B | 27. | C | 52. | A | 77. | E |
| 3. | A | 28. | C | 53. | A | 78. | C |
| 4. | B | 29. | A | 54. | A | 79. | C |
| 5. | B | 30. | B | 55. | A | 80. | C |
| 6. | C | 31. | A | 56. | A | 81. | A |
| 7. | A | 32. | A | 57. | A | 82. | C |
| 8. | C | 33. | A | 58. | E | 83. | E |
| 9. | A | 34. | B | 59. | D | 84. | B |
| 10. | B | 35. | B | 60. | A | 85. | E |
| 11. | C | 36. | E | 61. | B | 86. | A |
| 12. | C | 37. | E | 62. | A | 87. | B |
| 13. | A | 38. | B | 63. | A | 88. | E |
| 14. | B | 39. | E | 64. | A | 89. | E |
| 15. | A | 40. | A | 65. | B | 90. | A |
| 16. | B | 41. | B | 66. | C | 91. | A |
| 17. | A | 42. | E | 67. | B | 92. | A |
| 18. | B | 43. | E | 68. | E | 93. | A |
| 19. | C | 44. | B | 69. | E | 94. | C |
| 20. | C | 45. | C | 70. | D | 95. | A |
| 21. | C | 46. | C | 71. | A | 96. | A |
| 22. | A | 47. | C | 72. | B | 97. | A |
| 23. | C | 48. | A | 73. | B | 98. | E |
| 24. | A | 49. | A | 74. | C | 99. | A |
| 25. | B | 50. | D | 75. | D | 100. | E |

QUESTIONNAIRE B1

| Item | Alternative | Item | Alternative | Item | Alternative | Item | Alternative |
|---|---|---|---|---|---|---|---|
| 1. | B | 26. | B | 51. | D | 76. | D |
| 2. | D | 27. | A | 52. | A | 77. | A |
| 3. | A | 28. | B | 53. | D | 78. | E |
| 4. | C | 29. | E | 54. | A | 79. | D |
| 5. | B | 30. | E | 55. | A | 80. | C |
| 6. | A | 31. | A | 56. | D | 81. | D |
| 7. | A | 32. | E | 57. | D | 82. | E |
| 8. | E | 33. | A | 58. | D | 83. | B |
| 9. | A | 34. | A | 59. | C | 84 | C |
| 10. | A | 35. | C | 60. | C | 85. | E |
| 11. | C | 36. | C | 61. | B | 86. | C |
| 12. | D | 37. | C | 62. | B | 87. | A |
| 13. | D | 38. | B | 63. | A | 88. | E |
| 14. | C | 39. | A | 64. | E | 89. | A |
| 15. | B | 40. | B | 65. | C | 90. | C |
| 16. | B | 41. | A | 66. | C | 91. | B |
| 17. | B | 42. | A | 67. | A | 92. | A |
| 18. | C | 43. | A | 68. | A | 93. | B |
| 19. | A | 44. | C | 69. | B | 94. | D |
| 20. | B | 45. | A | 70. | A | 95. | C |
| 21. | D | 46. | A | 71. | E | 96. | A |
| 22. | E | 47. | A | 72. | B | 97. | C |
| 23. | B | 48. | C | 73. | A | 98. | C |
| 24. | C | 49. | A | 74. | E | 99. | B |
| 25. | E | 50. | A | 75. | A | 100. | A |

# APPENDIX D

# INSTRUCTIONS FOR SOCIAL DESIRABILITY RATING

INSTRUCTIONS TO JUDGES

The rating task is to judge, on a 9-point scale, the extent to which each item option represents a socially desirable or a socially undesirable response. In other words, what is the degree of social desirability or undesirability that you would associate with each of the possible answers to the questions? The following social desirability continuum is to be used:

| SOCIALLY UNDESIRABLE | | | | | | | | SOCIALLY DESIRABLE |
|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Extreme | Strong | Moderate | Mild | Neutral | Mild | Moderate | Strong | Extreme |

Notice that 1 is used to signify a response that is EXTREMELY SOCIALLY UNDESIRABLE; 5 signifies a neutral response that is neither SOCIALLY DESIRABLE nor UNDESIRABLE; and 9 signifies an EXTREMELY SOCIALLY DESIRABLE response. The experiences, attitudes, behaviors, etc. associated with the alternatives for any particular item may cover a broad or a narrow range of social desirability, as your judgment dictates.

Before you begin the ratings, read through several of the items at random to familiarize yourself with the social desirability range represented by this item sample. Keep the above scale in front of you for constant reference. Indicate your ratings beside each item alternative as in the example below.

Example (You may or may not agree with the sample ratings given)

101. In the community where you were raised, how concerned were people about the adequacy of local education?
   2 A. Most people favored reducing local taxes rather than improving the educational system
   2 B. A majority never considered the issue
   6 C. A few were sincerely concerned
   8 D. Most actively sought a first-class educational system
   1 E. I don't know what people thought

Please work independently. Do not allow any other person to influence your ratings.

Note: You may feel that the degree of social desirability associated with some answers is related to the sex or age of the respondent. In such instances assume the respondent to be of your own sex and of average college undergraduate age.

# APPENDIX E

## ARTIFICIAL (FAKE SET)

## INSTRUCTIONS

# UNIVERSITY APPLICATION FORM

This questionnaire is similar to extended application blanks currently used by many universities and business firms. It is being administered to you as part of a research project supported by the U. S. Department of Health, Education and Welfare.

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## SPECIAL INSTRUCTIONS

You are to respond to these items in a special way. Assume that this questionnaire is part of the application material being used by a university which you are very anxious to attend. Since you know that the answers you give to the questions will influence the university officials evaluating your application, MAKE YOURSELF LOOK GOOD by giving the answers which you think will impress them the most. In other words, stretch the truth if necessary in answering the questions to make yourself appear as a top-notch candidate.

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Please answer every question, giving only one response to each. Do not spend too much time on any single item, and if you are unsure of an answer, guess. Your responses will be used for research purposes only and will be kept strictly confidential.

Make no marks on the questionnaire booklet. Answer each question by blackening the appropriate oval on the answer card with the soft pencil provided.